network

Flashlink User Manual

MOT-BOX

Hard-shell case for one Flashlink 2U frame

Rev. 2

network-electronics.com

Network Electronics ASA

Thorøya
P.O. Box 1020
N-3204 Sandefjord, Norway

Phone: +47 33 48 99 99
Fax: +47 33 48 99 98
Email: support@network-electronics.com
www.network-electronics.com

Support Phone: +47 90 60 99 99

Revision history

Current revision of this document is the uppermost in the table below.

Rev.	Repl.	Date	Sign	Change description
2	1	2007-10-26	AS	New front page. Added Materials Declaration and EFUP.
1	0	2006-12-08	NBS	Added backplane spec. for AV-HD-XMUX and SDI-TD-(D)MUX-4
0	A	2005-07-13	NBS	No changes; first official release.
A	-	2005-06-09	NBS	Initial revision.

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1 Product overview

MOT-BOX is a lightweight mobile transport enclosure for the flashlink® range of products.

MOT-BOX houses all flashlink® optical transport, signal processing and distribution cards including WDM/CWDM. Its rugged design and connector panel, including an expanded beam hermaphroditic fiber connector, makes it the ideal choice for all mobile and outside broadcast applications.

Options include a fiber reel with MIL specified tactile fiber, AC and DC power supplies, and a monitoring/alarming function via Network's GYDA controller.

1.1 Features:

- Lightweight 3RU Mobile Transport Enclosure.
- Full set of flashlink optical, signal processing and distribution cards including WDM/CWDM.
- Expanded beam hermaphroditic fiber connector.
- Fiber reel with MIL specified tactile fiber (option).
- AC and DC power supply option.
- Rugged connector panel and enclosure design for tough mobile use (audio on XLR-breakouts).
- Monitoring/Alarming via GYDA controller (option).

2 Specifications

2.1 General specifications

AC Power:	PWR-AC15/15/5/5V AC power supply module 100-260 VAC.
DC Power (optional):	PWR-DC15/15/5/5V DC power supply module 36-72 VDC.
Dimensions:	WxDxH with front- and rear cover: 530 x 570 x 215 mm, Without front- and rear cover: 530 x 425 x 215 mm.
Weight:	Including PSU and 10 modules: <12 kg.
Card slots:	10.
Power Supply slots:	2.
Internal voltages:	+5V, -5V, +15V, -15V.

2.2 Front view

The front view of the MOT-BOX (with front cover removed) shows the status LEDs for each module that is included box + two green LEDs for the power supply modules.

Figure 1: LEDs in front of the flashlink frame.

The uppermost LED of each module card is a "general status" LED.

- *Green light* means that the card is OK.
- *Red light* means that the card is faulty.
- *No light* means that the power is not switched on.

The meaning of each LED on the module cards is described in their respective User Manuals.

2.3 Rear view

Figure 2 shows an example of a fully equipped MOT-BOX, seen from the rear side (with rear cover removed).

To the left is the connector module for the power supply delivered with the MOT-BOX. The other connector modules are described in Chapter 3.2 .

Figure 2: Example of fully equipped MOT-BOX.

3 Connections

3.1 Service connections

The figure below shows the power connections, Ethernet connections and the expanded beam hermaphroditic fiber connector of the frame.

Figure 3: Connector module for the power supply.

AC: Connect with a mains cord with an IEC 320 connector to the MOT BOX.

DC: Connect with a 4-pin XLR (female) from the external DC power supply to the *Neutrik NC4MD-L-1* 4-pin XLR (male) receptacle of the MOT BOX.

The following pin-out is applicable:

Pin #1	Negative part of 48VDC supply	Input
Pin #2	Not in use	
Pin #3	Not in use	
Pin #4	Positive part of 48VDC supply	Input

A green LED will light on the front when the power supply (AC or DC) is in operation.

Ethernet: Connect with an RJ-45 plug to the *Neutrik NE8FDV-YK* receptacle of the MOT BOX.

Fiber: Connect your fiber cable with a *Stratos HXMA 4-channel plug* to the *Stratos HXMA 4 channel expanded beam hermaphroditic fiber receptable* of the MOT BOX. You may connect the other end of the fiber cable to the dedicated 1RU frame, MB-FR-1RU. See Chapter 3.3 for more information.

3.2 Module connections

The connector/receptacle layout on the rear of the MOT-BOX is depending on the models that are included in the box/frame. The following options are available:

Backplane	Associated module(s)
MB-BP-00	Blindplate, no module associated.
MB-BP-01	ADC-AES
MB-BP-02	DAC-AES, DA-AA or DA-AES
MB-BP-03	SDI-OE, SDI-EO, HD-OE or HD-EO
MB-BP-04	DA-SDI, DA-SDI-NRC, DA-HDSDI, DA-VA, ADC-SDI, ADC-SDI-CC, DAC-SDI or SDI-TD-(D)MUX-4
MB-BP-05	AV-MUX or AV-HD-XMUX[1]
MB-BP-06	AAV-MUX or AVA-MUX
MB-BP-07	AV-DMUX, AV-HD-XMUX[2], AAV-DMUX or AVA-DMUX
MB-BP-08	D422-MG (RS422)
MB-BP-09	D422-MD (GPI in and out)

The pin-out of the XLR connectors in the following Chapters are according to known standards, as follows:

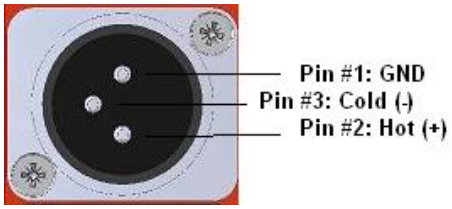


Figure 4: XLR pin-out.

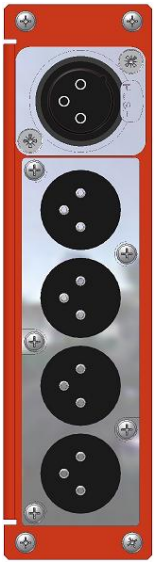
[1] AV-HD-XMUX with AES IN.
[2] AV-HD-XMUX with AES OUT.

3.2.1 MB-BP-01

ADC-AES
AES OUT
Audio IN 1L
Audio IN 1R
Not in use
AES11 Sync.

Figure 5: MB-BP-01.

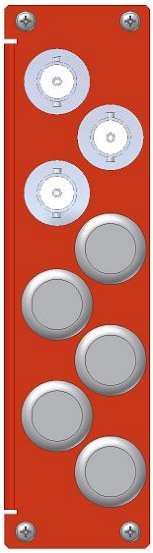
3.2.2 MB-BP-02



DAC-AES	DA-AES	DA-AA
AES IN		Audio IN
Audio OUT 1L	AES OUT1	Audio OUT1
Audio OUT 1R	AES OUT2	Audio OUT2
Audio OUT 1L	AES OUT3	Audio OUT3
Audio OUT 1R	AES OUT4	Audio OUT4

Figure 6: MB-BP-02.

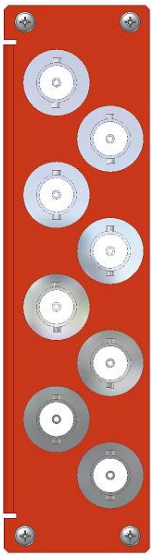
3.2.3 MB-BP-03



SDI/HD-EO	SDI/HD-OE
SDI/HD IN	Not in use
SDI/HD OUT 1	
SDI/HD OUT 2	

Figure 7: MB-BP-03.

3.2.4 MB-BP-04



Video DA[3]	ADC-SDI	ADC-SDI-CC	DAC-SDI	SDI-TD-(D)MUX-4
IN	Ch1	CVBS/Y	SDI IN	SD1
01	Ch2	R/Pr	BBurst	SD2
02	Dup1	G/Y	CVBS	SD3
03	Dup2	B/Pb/C	R	SD4
04	SDI 1	SDI OUT	G	HD
05	SDI 2	SDI OUT	B	*Not in use*
06	SDI 3	SDI OUT	SDI OUT	*Not in use*
Not in use				

Figure 8: MB-BP-04.

[3] DA-HDSDI, DA-SDI, DA-SDI-NRC or DA-VA.

3.2.5 MB-BP-05

AV-MUX	AV-HD-XMUX[4]
SDI IN	
SDI OUT	
AES IN 1	
AES IN 2	
AES IN 3	
AES IN 4	

Figure 9: MB-BP-05.

3.2.6 MB-BP-06

AAV-MUX	AVA-MUX
SDI IN	CVBS IN
SDI OUT	
Audio IN 1L	
Audio IN 1R	
Audio IN 2L	
Audio IN 2R	

Figure 10: MB-BP-06.

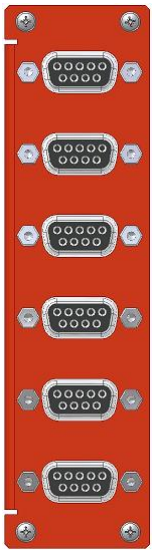
[4] AV-HD-XMUX with AES IN.

3.2.7 MB-BP-07

AV-DMUX	AV-HD-XMUX[5]	AAV-DMUX	AVA-DMUX
SDI IN			
SDI OUT			
AES OUT 1		Audio OUT 1L	
AES OUT 2		Audio OUT 1R	
AES OUT 3		Audio OUT 2L	
AES OUT 4		Audio OUT 2R	

Figure 11: MB-BP-07.

3.2.8 MB-BP-08



D422-MG (RS-422)
RS-422 #1
RS-422 #2
RS-422 #3
RS-422 #4
RS-422 #5
RS-422 #6

Figure 12: MB-BP-08.

The following pin-out applies to the DB9 contacts:

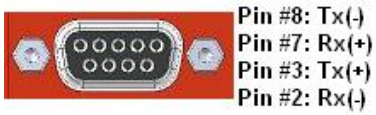
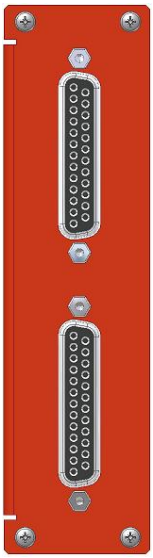


Figure 13: DB9 RS-422 pin-out.

[5] AV-HD-XMUX with AES OUT.

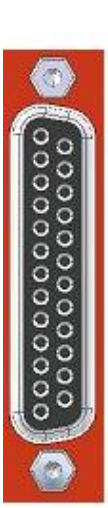
3.2.9 MB-BP-09



D422-MG (GPI I/O)
GPI IN
GPI OUT

Figure 14: MB-BP-09.

The following pin-out applies to the DB25 contacts:



I/O #01: Pin #12
I/O #02: Pin #24
I/O #03: Pin #23
I/O #04: Pin #10
I/O #05: Pin #09
I/O #06: Pin #21
I/O #07: Pin #20
I/O #08: Pin #07
I/O #09: Pin #06
I/O #10: Pin #18
I/O #11: Pin #17
I/O #12: Pin #04
I/O #13: Pin #03
I/O #14: Pin #15
I/O #15: Pin #14
I/O #16: Pin #01
GND: Pin #02,05,08,
11,13,16,19,22,25

Figure 15: DB25 GPI I/O pin-out.

3.3 MB-FR-1RU

In order to connect your MOT-BOX to an OB-Van (e.g.) via a fiber-optic cable, you may use the dedicated 1RU frame, MB-FR-1RU on the stationary side, e.g. the OB-Van.

Figure 16: MB-FR-1RU front view.

MB-FR-1RU has the possibility to connect 5 fiber cables, thus connecting to 5 different MOT-BOX devices. Each connection has 4 optical channels. The fiber cable between MOT-BOX and MB-FR-1RU use *Stratos HXMA 4-channel plugs* to connect with. The layout of this connector is as follows:

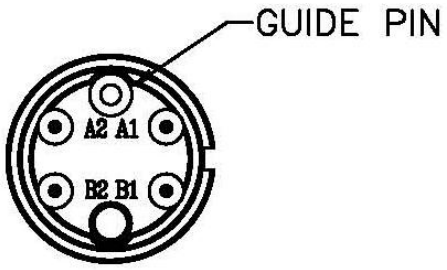


Figure 17: Stratos HXMA 4-channel details.

The layout of the connector on the rear side of the MB-FR-1RU is as follows:

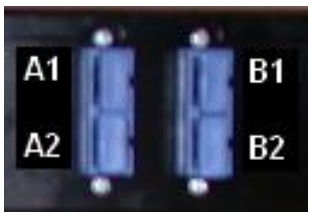


Figure 18: MB-FR-1RU rear connector details.

The table below shows the corresponding optical signals, between the *Stratos HXMA 4-channel plug* on the MOT-BOX rear side (Figures 3 and 17) and the rear connectors of the MB-FR-1RU (Figure 18):

MOT-BOX	MB-FR-1RU
A1	B1
A2	B2
B1	A1
B2	A2

Thus, the signal coming from the MOT-BOX on channel A1 connects to the MB-FR-1RU on channel B1, et cetera.

The rear connectors on the MB-FR-1RU are used to patch the signals to an accompanying flashlink® frame with E/O and/or O/E converters.

In this way, optical communication between the MOT-BOX and a stationary configuration, e.g. an OB-Van is accomplished.

3.4 Frame reconfiguration

In order to reconfigure or expand the number of modules within the MOT BOX, see the User Manual for the FR-2RU-10-2 frame.

4 MOT-BOX safety precautions

In order to protect your MOT-BOX and the modules inside, please pay attention to the following:

> Note!
>
> Never block the air ventilation openings!
>
> Damage of the modules inside the MOT-BOX may be the result if any of these are blocked.

The ventilation openings are on both the front- and rear sides of the MOT BOX.

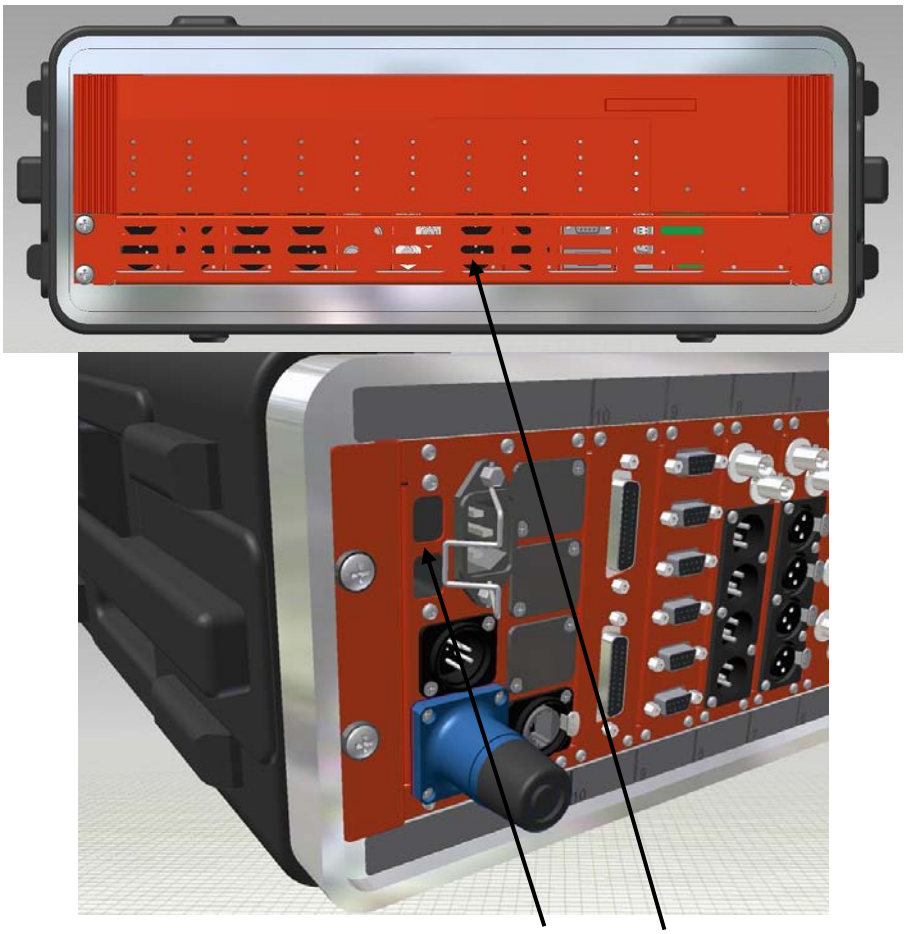


Figure 19: Air vents on the MOT-BOX rear- and front side.

> Note!
>
> Turn off the MOT-BOX if there is no air flow out of the rear side of the box.
>
> No air flow may indicate that the fan is out of order. Service is then required.

5 Laser safety precautions

Guidelines to limit hazards from laser exposure.

All the available EO units in the Flashlink® range include a laser.

Therefore this note on laser safety should be read thoroughly.

The lasers emit light at 1310 nm or 1550 nm. This means that the human eye cannot see the beam, and the blink reflex cannot protect the eye. (The human eye can see light between 400 nm to 700 nm).

A laser beam can be harmful to the human eye (depending on laser power and exposure time), therefore:

> Note!
>
> BE CAREFUL WHEN CONNECTING / DISCONNECTING FIBER PIGTAILS (ENDS).
>
> NEVER LOOK DIRECTLY INTO THE PIGTAIL OF THE LASER/FIBER.
>
> NEVER USE MICROSCOPES, MAGNIFYING GLASSES OR EYE LOUPES TO LOOK INTO A FIBER END.
>
> USE LASER SAFETY GOGGLES BLOCKING LIGHT AT 1310 nm AND AT 1550 nm.

Instruments exist to verify light output power: Power meters, IR-cards etc.

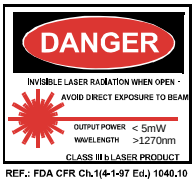
Flashlink® features:

The MOT-BOX / FR-2RU-10-2 is classified as Class 1 laser product according to EN 60 825-1:94/A11:96, and CFR Ch1(1997) Part 1040.10.

If the front panel is removed, the MOT-BOX / FR-2RU-10-2 is classified as Class 1 laser product according to EN 60 825-1:94/A11:96, and class IIIb according to CFR Ch1(1997) Part 1040.10.

Maximum output power: 5 mW.

Operating wavelengths: 1310 nm or 1550 nm.



General environmental requirements for Network Electronics equipment

1. The equipment will meet the guaranteed performance specification under the following environmental conditions:
   - Operating room temperature range: 0°C to 40°C
   - Operating relative humidity range: <90% (non-condensing)

2. The equipment will operate without damage under the following environmental conditions:
   - Temperature range: -10°C to 45°C
   - Relative humidity range: <95% (non-condensing)

3. Electromagnetic compatibility conditions:
   - Emissions: EN 55103-1 (Directive 89/336/EEC)
   - Immunity: EN 55103-2 (Directive 89/336/EEC)

Certificate of Conformity

Network Electronics ASA N-3204 Sandefjord Norway	Company Registration Number: NO 976 584 201 MVA

Declares under sole responsibility that the product:

Product name:	MOT-BOX
Product description:	Hard-shell case for one Flashlink® 2U frame.

To which this declaration relates are of Norwegian origin and are in conformity with the following standards:

EN 55103-1: 1996	Generic Emissions Standard
EN 55103-2: 1996	Generic Immunity Standard

Product Warranty

The warranty terms and conditions for the product(s) covered by this manual follow the General Sales Conditions by Network Electronics ASA. These conditions are available on the company web site of Network Electronics ASA:

www.network-electronics.com

Appendix A Materials declaration and recycling information

A.1 Materials declaration

For product sold into China after 1st March 2007, we comply with the "Administrative Measure on the Control of Pollution by Electronic Information Products". In the first stage of this legislation, content of six hazardous materials has to be declared. The table below shows the required information.

組成名稱 Part Name	Toxic or hazardous substances and elements					
	鉛 Lead (Pb)	汞 Mercury (Hg)	镉 Cadmium (Cd)	六价铬 Hexavalent Chromium (Cr(VI))	多溴联苯 Polybrominated biphenyls (PBB)	多溴二苯醚 Polybrominated diphenyl ethers (PBDE)
MOT-BOX	O	O	O	O	O	O

O: Indicates that this toxic or hazardous substance contained in all of the homogeneous materials for this part is below the limit requirement in SJ/T11363-2006.

X: Indicates that this toxic or hazardous substance contained in at least one of the homogeneous materials used for this part is above the limit requirement in SJ/T11363-2006.

This is indicated by the product marking:

A.2 Recycling information

Network Electronics provides assistance to customers and recyclers through our web site http://www.network-electronics.com. Please contact Network Electronics' Customer Support for assistance with recycling if this site does not show the information you require.

Where it is not possible to return the product to Network Electronics or its agents for recycling, the following general information may be of assistance:

- Before attempting disassembly, ensure the product is completely disconnected from power and signal connections.
- All major parts are marked or labelled to show their material content.
- Depending on the date of manufacture, this product may contain lead in solder.
- Some circuit boards may contain battery-backed memory devices.